REMARKS

Claims 1-18 are pending in this application. The drawings and specification are objected to in view of specific informalities identified by in the Office Communication. Claims 1-7 and 10 and 11 are rejected under 35 USC 112, second paragraph. Claims 1-3, 5-8, 10, 12 and13 are rejected under 35 USC 102(b) as being anticipated by Guntner. Claims 3 and 4 are rejected under 35 USC 103(a) as being unpatentable over Guntner in view of Presz. Claims 9 and 14 and claims 15-17 are rejected under 35 USC 103(a) as being unpatentable over Guntner in view of paper A3 submitted by Applicant. Claims 11 and 18 are rejected under 35 USC 103(a) as being unpatentable over Guntner

The specification has been amended to include the reference numeral "2", thereby overcoming the drawing objection contained in paragraph 1 of the Office Communication.

A revised FIG. 3 is submitted concurrently with this Response to overcome the drawing objection contained in paragraph 2 of the Office Communication. The applicants note that the specification does not require the corner members to be the same or to all take the form illustrated in FIG. 3, but rather, FIG. 3 is provided only as one example of one flow directing diffuser, as stated on lines 1-2 of page 5 of the specification.

The specification has also been amended to correct the informality on page 6, thereby overcoming the specification objection contained in paragraph 4 of the Office Communication.

The rejection of claims 1-7 under 35 USC 112 has been rendered moot by the cancellation of claim 1.

The wording of claim 10 has been amended, thereby overcoming the rejection of claims 10 and 11 under 35 USC 112.

Claims 1 and 2 have been cancelled. Claim 3 has been amended to be in independent form and to include the limitations of "a flow turning vane comprising a corner member disposed proximate a corner of the duct and extending into a relatively higher velocity annular portion of the flow of cooling air and disposed remote from a

center portion of the flow of cooling air for directing a portion of the cooling air from the relatively higher velocity annular portion of the flow of cooling air into a relatively lower velocity corner portion of the flow of cooling air without restricting the center portion of the flow of cooling air." Neither the Guntner patent nor any of the other cited prior art teaches or suggests such a combination of limitations.

A translation of selected sections of the Guntner patent was obtained by the application and is attached hereto for the Examiner's information. Gutner describes a turbulator 1 that includes a circular center portion 1A. The center portion 1A will restrict the passage of air through the center of the duct 9 and housing 7, 8. The center portion of the airflow downstream of the motor 5 will naturally have a relatively low velocity, and the presence of the turbulator center portion 1A only serves to exacerbate this undesirable condition. To the contrary, the device of claim 3 includes a corner member that is disposed remote from the center portion of the flow of cooling air in order to direct a portion of the cooling air from the higher velocity annular portion into the lower velocity corner portion without restricting the center portion of the flow of cooling air. Thus, claim 3 and its dependent claims 4-7 are believed to be in condition for allowance.

Claim 4 includes the further limitation of the flow turning vane comprising "a V-shaped corner member having a first portion disposed in the relatively higher velocity annular portion and having a second portion extending toward the corner". The Examiner cites Presz as teaching a V-shaped diffuser. However, the Presz diffuser is not a member that extends into the airflow to redirect a portion of the airflow. Rather, the diffuser of Presz is simply a portion of the conduit carrying the air, i.e. the wall of the conduit defining the pressure boundary rather than a member disposed within the pressure boundary. The diffuser of Presz functions to reduce boundary layer separation (eddy currents) as the flow is expanded within the conduit. The V-shape of the Presz diffuser receives the air flow whereas the corner member of claim 4 directs the air. Presz fails to teach or suggest the limitations of a V-shaped corner member "having a first portion disposed in the relatively higher velocity annular portion and having a second portion extending toward the corner." Presz teaches away from this limitation by describing a diffuser that is entirely positioned at the corner of the conduit within the

flow velocity area. Accordingly, the limitations of claim 4 provide an additional basis for the allowance of claim 4.

Claim 6 has been cancelled and claim 5 has been amended to include the limitations of an annular member for directing a portion of the cooling air from the relatively higher velocity annular portion into the center portion of the flow of cooling air; and wherein the corner member is connected to the duct and the annular member is connected to the corner member in order to provide support for both the corner member and the annular member without restricting the center portion of the flow of cooling air. The device of Guntner teaches away from these limitations by describing a turbulator 1 that is supported from its center, thereby blocking the flow of air in the already low flow center region. Accordingly, the limitations of claim 5 provide an additional basis for the allowance of claim 5 and its dependent claim 7.

Claim 7 has been amended to include the limitations of " a second annular member disposed in the flow of cooling air downstream of the first annular member and upstream of the resistor stack, the second annular member cooperating with the first annular member for directing the portion of the cooling air from the relatively higher velocity annular portion of the flow of cooling air into the center portion of the flow of cooling air with reduced turbulence in the flow of cooling air than would be created by directing the same portion of the cooling air into the center portion of the flow of cooling air with only a single annular member." The two turning vanes 3 and 1B of Guntner do not cooperate to direct air to the same region, but rather serve two different and opposed functions of directing air into the center region and into the corners, respectively. Furthermore, the second annular member is not merely duplicative, since the two annular members cooperate with each other to provide reduced turbulence, as now delimited in claim 7 and as explained in the specification on page 8, lines 15-24. Accordingly, the limitations of claim 7 provide an additional basis for the allowance of claim 7.

Independent claim 8 has been amended to include the limitation of "a flow directing vane disposed within the duct for directing a portion of the flow of air from the relatively higher velocity annular area into a corner region of the duct without restricting the relatively lower velocity center area." The turbulator 1 of Guntner teaches away from

this limitation by including a center portion 1A that blocks the flow in the center area. Thus claim 8 and its dependent claims 9-11 are believed to be in condition for allowance.

Claim 9 includes the further limitation of the fan comprising a mixed flow fan. The Examiner cites the paper A3 submitted by the Applicant as showing a mixed flow fan for use in cooling a resistor stack. However, a closer examination of that reference reveals that the mixed flow fan is only described as being used for "engine cooling with hydraulic or mechanical drive." Equipment cooling and general ventilation are described as applications for Tube Axial fans, which is consistent with the admission by the applicants in the specification at page 6, line 16. The only mention of brake resistor cooling is in a general listing of "Applications for Airscrew Limited Fans." There is no teaching or suggestion in paper A3 that mixed flow fans may be used for brake resistor cooling. The applicants have discovered that the unique properties of a mixed flow fan are useful in this application, as described in the specification at page 6, line 16 through page 7, line 16. Accordingly, the limitations of claim 9 provide an additional basis for the allowance of claim 9.

Claim 10 includes the limitations of an annular member connected to the flow directing vane for directing a portion of the flow of air from the relatively higher velocity annular area to the relatively lower velocity center area. Like the flow directing vane of the independent claim 8, the annular member of dependent claim 10 does not restrict the flow of air in the center area. Mechanical support for the annular member is provided by connecting the flow directing vane to the annular member. Guntner teaches away from such limitations by describing structures that restrict the flow of air in the center region. Accordingly, the limitations of claim 10 provide an additional basis for the allowance of claim 10.

Claim 11 includes the limitation of a second annular member cooperating with the first annular member to direct a portion of the air flow to the center area. Guntner fails to describe two flow directing members cooperating to direct flow to a single area. The two annular members of claim 11 are not merely duplicative because they cooperate to reduce turbulence in the flow of air when compared to directing the same portion of air into the center area with only a single annular member. Accordingly, the limitations of claim 11 provide an additional basis for the allowance of claim 11.

Claim 12 has been cancelled.

Independent claim 13 is directed to a locomotive braking grid package and it includes the limitations of a flow turning vane disposed within the duct remote from the relatively lower velocity center portion for directing a portion of the cooling air from the higher velocity annular portion into a corner area of the duct without restricting the center portion. Guntner teaches away from these limitations by describing a turbulator 1 having a circular center portion 1A that blocks the center area. Thus claim 13 and its dependent claim 14 are believed to be in condition for allowance.

Claim 14 includes the limitation of the fan comprising a mixed flow fan. Nothing in paper A3 cited by the applicants suggests such a limitation, but rather, paper A3 only supports the applicant's admission that axial fans have been used in this application in the prior art. Accordingly, the limitations of claim 14 provide an additional basis for the allowance of claim 14.

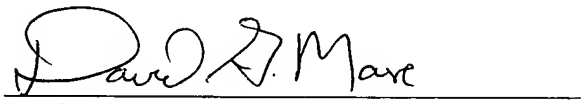
Each of claims 15-18 include the combination of a plurality of electrical resistors packaged in a grid stack and a mixed flow fan producing a flow of cooling air for the grid stack. Nothing in paper A3 cited by the applicants suggests such a limitation, but rather, paper A3 only supports the applicant's admission that axial fans have been used in this application in the prior art. Thus claims 15-18 are believed to be in condition for allowance.

New dependent claims 19-22 have been added. Each of these claims includes the limitations of two interconnected flat plates forming a V-shape connected to the duct and disposed at an angle relative to a longitudinal axis of the duct for directing a portion of the air from a higher velocity region to a lower velocity region without imparting tangential velocity to the flow of air. Support for these new claims can be found on page 6, lines 5-15 of the specification, in FIG. 3, and in the inherent operation of the invention as described therein. The turbulator 1 of Guntner does not utilize two flat plates forming a V-shape connected to the duct, and further, the turbulator 1 of Guntner will inherently impart a significant tangential velocity to the flow of air. Such tangential velocity is not desirable for the cooling of the downstream resistor grid and is avoided by the devices of claims 19-22.

New independent claim 23 has been added. This claim includes the limitations of a first annular flow directing member and a second annular flow directing member disposed in the flow of cooling air, the second annular flow directing member cooperating with the first annular flow directing member for directing the portion of the cooling air from the relatively higher velocity annular portion of the flow of cooling air into the relatively lower velocity center portion of the flow of cooling air with reduced turbulence in the flow of cooling air than would be created by directing the same portion of the cooling air into the center portion of the flow of cooling air with only a single annular flow directing member. The two turning vanes 3 and 1B of Guntner do not cooperate to direct air to the same region, but rather serve two different and opposed functions of directing air into the center region and into the corners, respectively. Furthermore, the second annular member is not merely duplicative, since the two annular members cooperate with each other to provide reduced turbulence when compared to directing the same portion of cooling air with only a single annular flow directing member, as explained in the specification on page 8, lines 15-24. Accordingly, claim 23 is believed to be in condition for allowance.

Reconsideration of the application and allowance of claims 3-5, 7-11 and 13-23 are respectfully requested.

Respectfully submitted,



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